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E. J. STONE, M.A., F.R.S., President, in the Chair.

Frederick C. Green, Woodside Cottage, Breightmet, near Bolton, Lancashire ;

Alexander Hamilton Howe, M.D., Hullerhirst, Stevenston, Ayrshire :

The Rev. J. Calbraith Lunn, Warrenpoint, Co. Down, Ireland ;

S. T. H. Saunders, M.A., Merchant Taylors' School, E.C. ;

Edmund Johnson Spitta, L.R.C.P., Ivy House, Clapham Common, S.W. ; and

William Henry Walmsley, 35 Limes Grove, Lewisham, S.E.,
were balloted for and duly elected Fellows of the Society.

Observation of the Transit of Venus 1882, December 6, made at the Allegheny Observatory. By Professor S. P. Langley.

(Communicated by E. B. Knobel.)

The observation of the Transit of *Venus* was so interrupted here by clouds yesterday that the times of contact have little value. A very unexpected and, I think, new phenomenon was noted however, connected with the luminosity about the planet, which deserves description in detail.

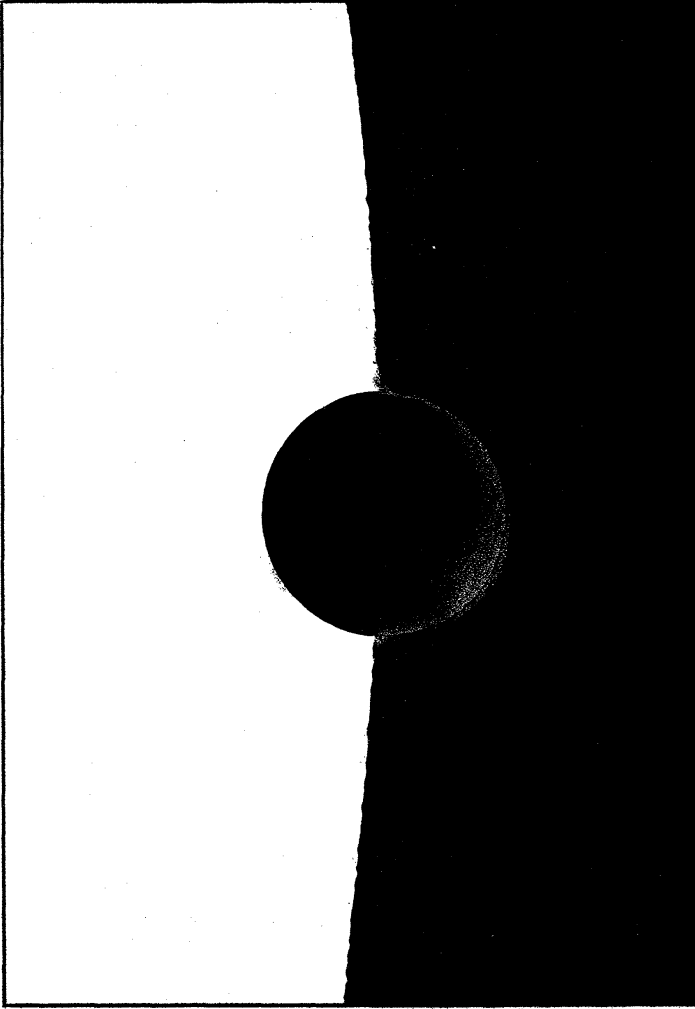
The telescope employed by the writer was the Equatorial of 13 inches aperture, temporarily limited to 6 inches, and used with a positive power of 244 upon the polarising solar eyepiece, which does not admit of a position circle.

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The planet (whose first external contact was noted here at $20^{\text{h}} 44^{\text{m}} 15^{\text{s}}$, the first internal contact being at $21^{\text{h}} 5^{\text{m}} 0^{\text{s}}$) was seen through thin clouds which were passing incessantly over the Sun's face. At $20^{\text{h}} 47^{\text{m}}$, the part of the planet already on being conspicuous, the limb was boiling badly, and the anticipated ring of light around the exterior part of *Venus* was not visible. After an interruption, observation was resumed at about $20^{\text{h}} 53^{\text{m}}$, and a remarkable change was noticed. The planet was now nearly half entered on the disk, and still showed no uniform ring of light, but a very notable gathering of brightness, extending along some 30° of its southern and western circumference (outside the limb of the Sun). The centre of this bright marginal segment was estimated, from a rough sketch made at the telescope, as being about 30° on one side of a line joining the centres of the Sun and planet, and its asymmetrical position with reference to the horns of the solar crescent was conspicuous. The light was prolonged very faintly up to the Sun's edge on the western side, the eastern part of the planet being at this time scarcely yet distinguishable (as seen through the light haze) from its black background.

At $20^{\text{h}} 57^{\text{m}}$, after an interruption by clouds, the line of light could be followed all round, as described by previous observers, but the bright marginal enlargement of this ring remained unchanged. At $21^{\text{h}} 0^{\text{m}}$ (five minutes before internal contact) this bright spot was still visible. It was therefore watched by me, with occasional interruptions, for about seven minutes. Owing to the boiling of the limb, it was not easy to determine how much of this light lay without, how much within, the planet's contour. When first seen, it suggested for a moment the appearance of Baily's Beads, but the writer's very strong final impression was that it at any rate extended to some degree within the planet, and was brightest on the outside, with a slight gradation toward the planet's centre. Its greatest width was estimated at one-fourth of the planet's radius. Every precaution was taken against instrumental error. The spot was successively examined in different parts of the field, the eyepiece was rotated, and the amount of light from the reflectors was varied. It was beyond any question a real, if a most unexpected and unintelligible phenomenon, and it seems to me that it points to a real local cause on the planet. It does not appear to be at all assimilable to the concentric spots which some observers have believed they saw both on *Venus* and on *Mercury* in transit, nor to the alleged phosphorescence on the dark side.

At the same time Mr. J. E. Keeler, my assistant, using a telescope of only $2\frac{1}{4}$ inches aperture and a power of 70, independently observed and sketched the same phenomenon, though, owing to the size of his instrument, he appears not to have seen it in quite the same detail. He first saw it distinctly at $20^{\text{h}} 49^{\text{m}} 20^{\text{s}}$ (during the time in which the writer was called away from his own instrument), but had indistinctly noted it



*Spot of light seen on Venus when entering on the Sun. 1882, December 6.
From a drawing by Prof. S.P. Langley.*

W.H. Wesley lith.

West, Newman & Co. imp.

Jan. 1883.

P. F. Denza, *Le passage de Vénus*.

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fully a minute before, when he describes it as looking like a little star.

Mr. Keeler's impression was, that the light lay chiefly or wholly *outside* the planet's contour. His memorandum sketch made at the telescope places the brightest point 20° of the planet's circumference to the west of the line joining the centres of the Sun and *Venus*. He saw it at intervals for over eight minutes, and records it as still visible at $20^h 58^m 11^s$.

It will be seen that the two independent estimates differ from each other by 10° as to the spot's position. If we take their mean, and assume that the position-angle of the planet itself on the Sun at the time was 148° , we obtain 173° as the position-angle of the bright spot, a line through which and the planet's centre would, as it readily appears, make an apparent angle of 76° with the plane of the ecliptic. After internal contact the limb of *Venus* was spectroscopically examined for absorption lines, but without effect. Clouds put an end to these latter observations before any result was reached other than that if any such absorption exists it is inconspicuous in the regions near D.

A drawing copied from my own sketch of this very curious phenomenon is here given.

Allegheny Observatory, Pa.:
1882, Dec. 7.

Le passage de Vénus observé à l'Observatoire de Moncalieri.
Par le P. F. Denza.

Nous nous étions préparés à observer avec le plus grand soin possible les deux premiers contacts, extérieur et intérieur, et à faire l'une ou l'autre des observations recommandées dans les instructions que l'Observatoire de Washington a publiées pour cette circonstance. Je dirai ici un mot de quelques-unes parmi les plus intéressantes.

Avant que le phénomène commençât, la partie occidentale du ciel, où se trouvait le soleil, fut encombrée de nuages strati-formes, qui, en devenant tantôt plus rares, tantôt plus denses, rendaient le bord solaire extrêmement agité, et par suite rendaient l'observation incertaine. Et cette portion du ciel se maintint dans cet état jusqu'au coucher du soleil.

Ce fut pour cela que nous dûmes renoncer à quelques observations spectroscopiques, que nous nous étions proposé de faire. Par contre, nous nous occupâmes à déterminer avec la plus grande attention qu'il nous fut possible, les instants des deux contacts. J'observais au réfracteur de Merz de 4 pouces d'ouverture. Le grossissement employé fut 54 pour le contact extérieur, et de 120 pour le contact intérieur.

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